


Commission for Environmental Cooperating MPA Rapid Vulnerability Assessment Project



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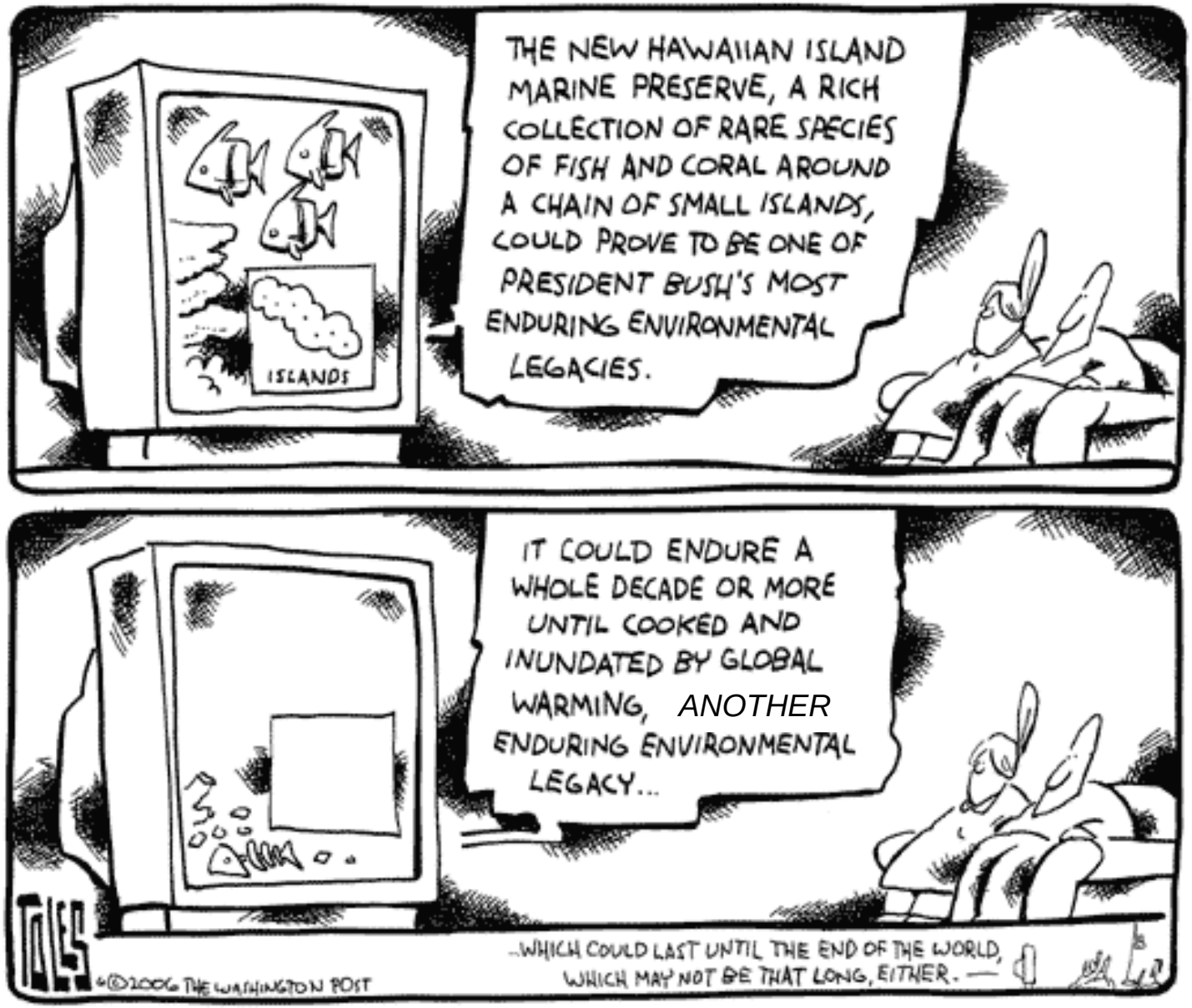
EcoAdapt™
Meeting the challenges of climate change

Why Adaptation?



Vulnerability

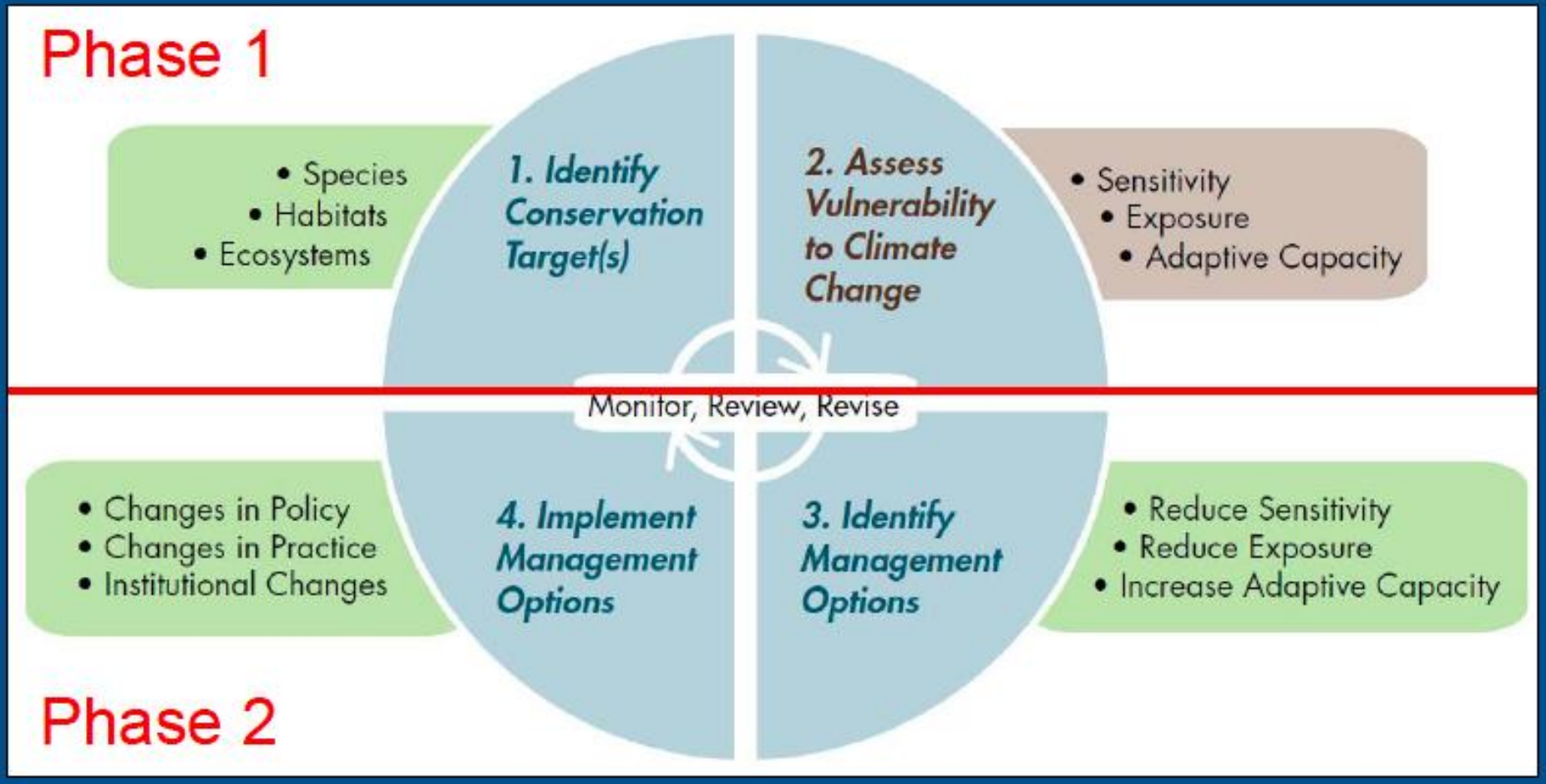
Adaptation Options

Resistance

Resilience

Response

Climate-Smart Adaptation Process

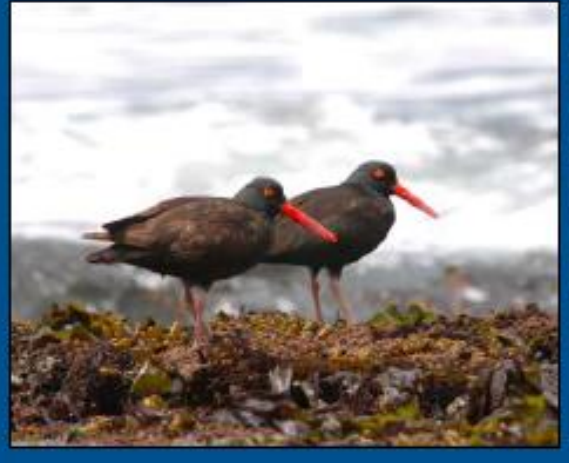


Glick et al. 2011 Scanning the Conservation Horizon

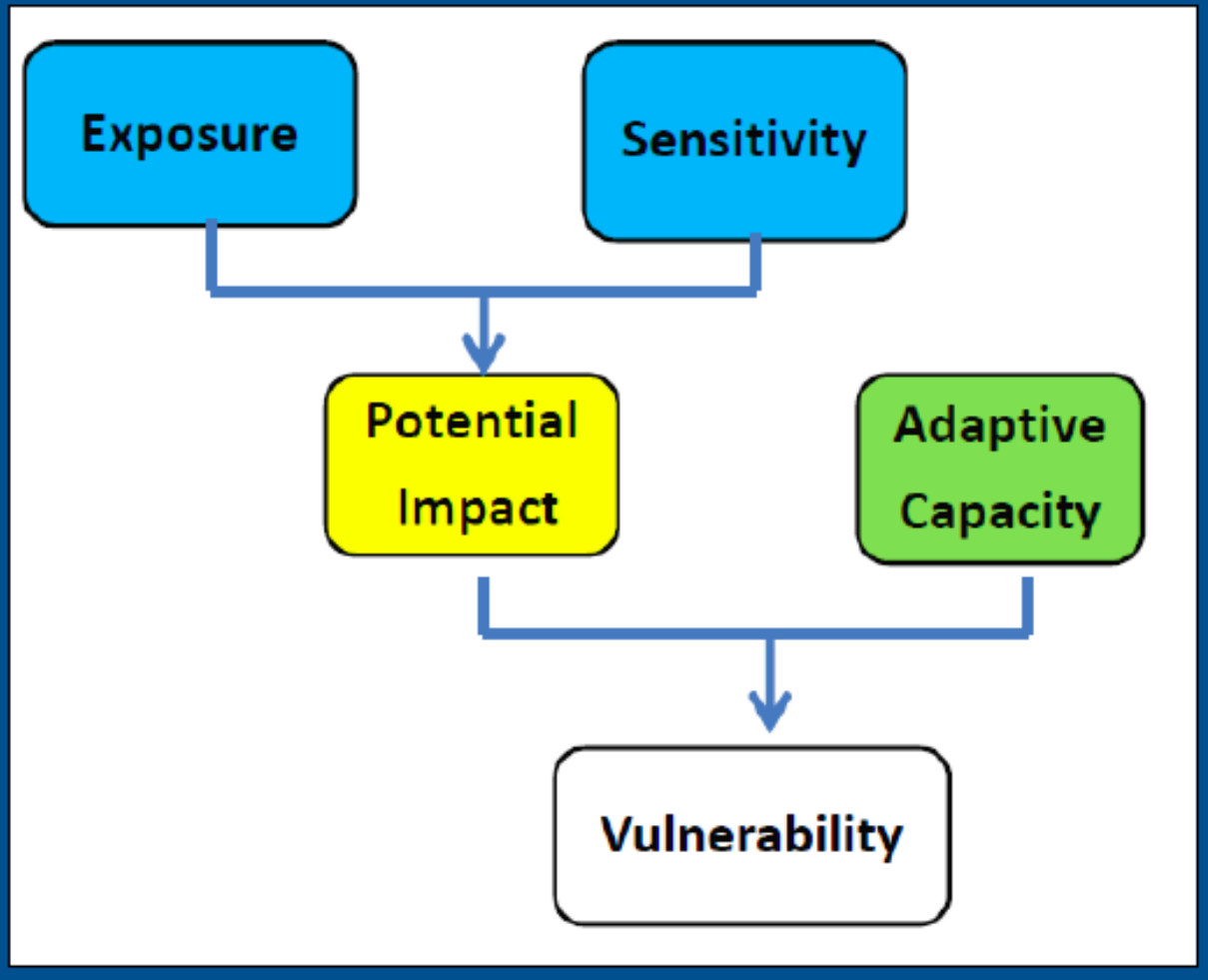
Phase 1: Vulnerability Assessment

Two Decision-Support Workshops:

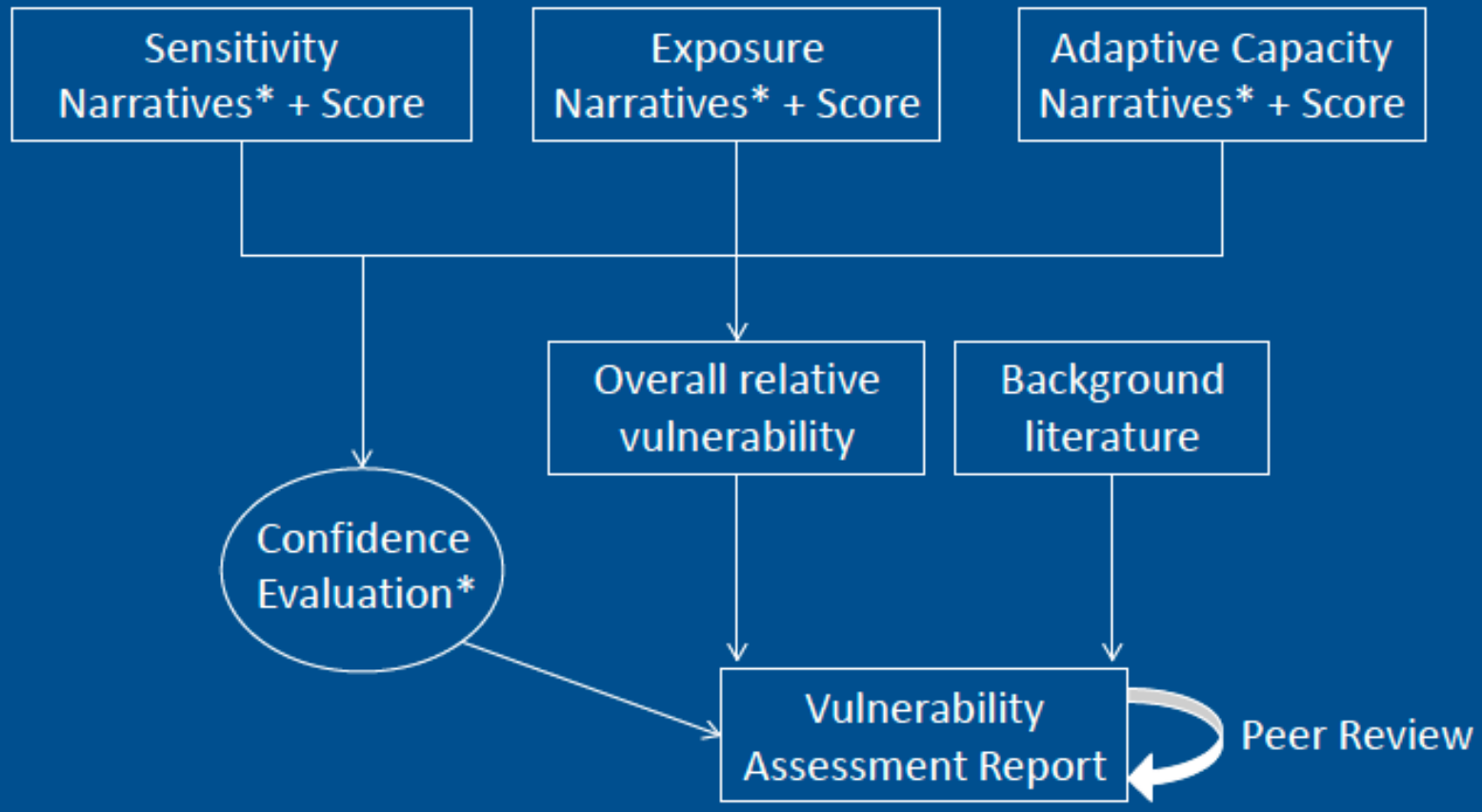
1. Define focal resources (11 Feb 2014)
2. Assess resource vulnerability (10-11 June 2014)



Phase 1: Vulnerability Assessment



Phase 1: Vulnerability Assessment



*documenting uncertainty

Marine Sanctuaries Conservation Series ONMS (succession number to be added by NMSP personnel)

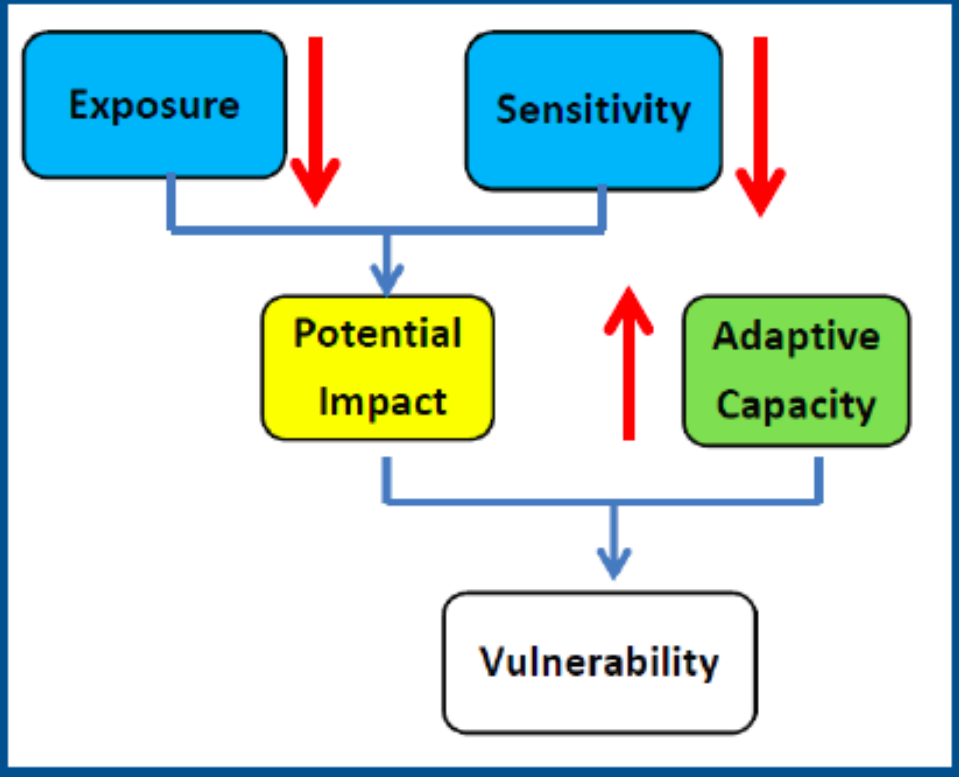
Climate Change Vulnerability Assessment for the North-central California Coast and Ocean

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Office of National Marine Sanctuaries

Insert Month Year

Phase 2: Adaptation Planning

Use assessment results to develop management strategies that will…



…in a variety of plausible future climate scenarios

After the Working Group

Recommended actions presented to the Sanctuary Advisory Council

Internal planning process via a **Sanctuary Implementation Plan**

Made available to other management agencies via a **Phase II Summary Report**

Example 3:

Greater Farallones NMS

Sea Level Rise, Δ Hydrology, Coastal Erosion

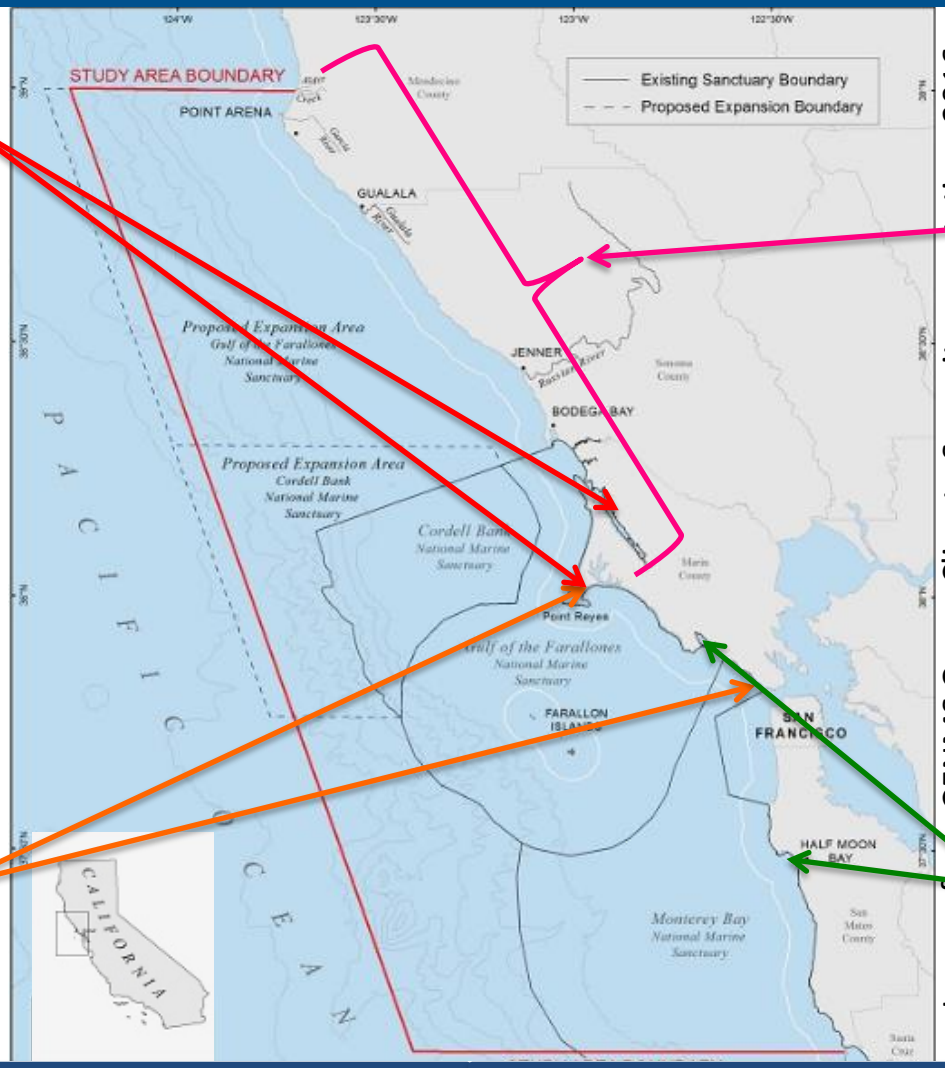
78 strategies developed by the working group

Adaptation actions planned spatially and temporally

☐ Resistance	☐ Resilience	☐ Response	☐ Realignment

Greater Farallones NMS: Spatial Adaptation

Promote landward migration



Images from GFNMS Ocean Climate Summit presentation, 2016

Let go of pocket beaches that can't retreat; no management intervention

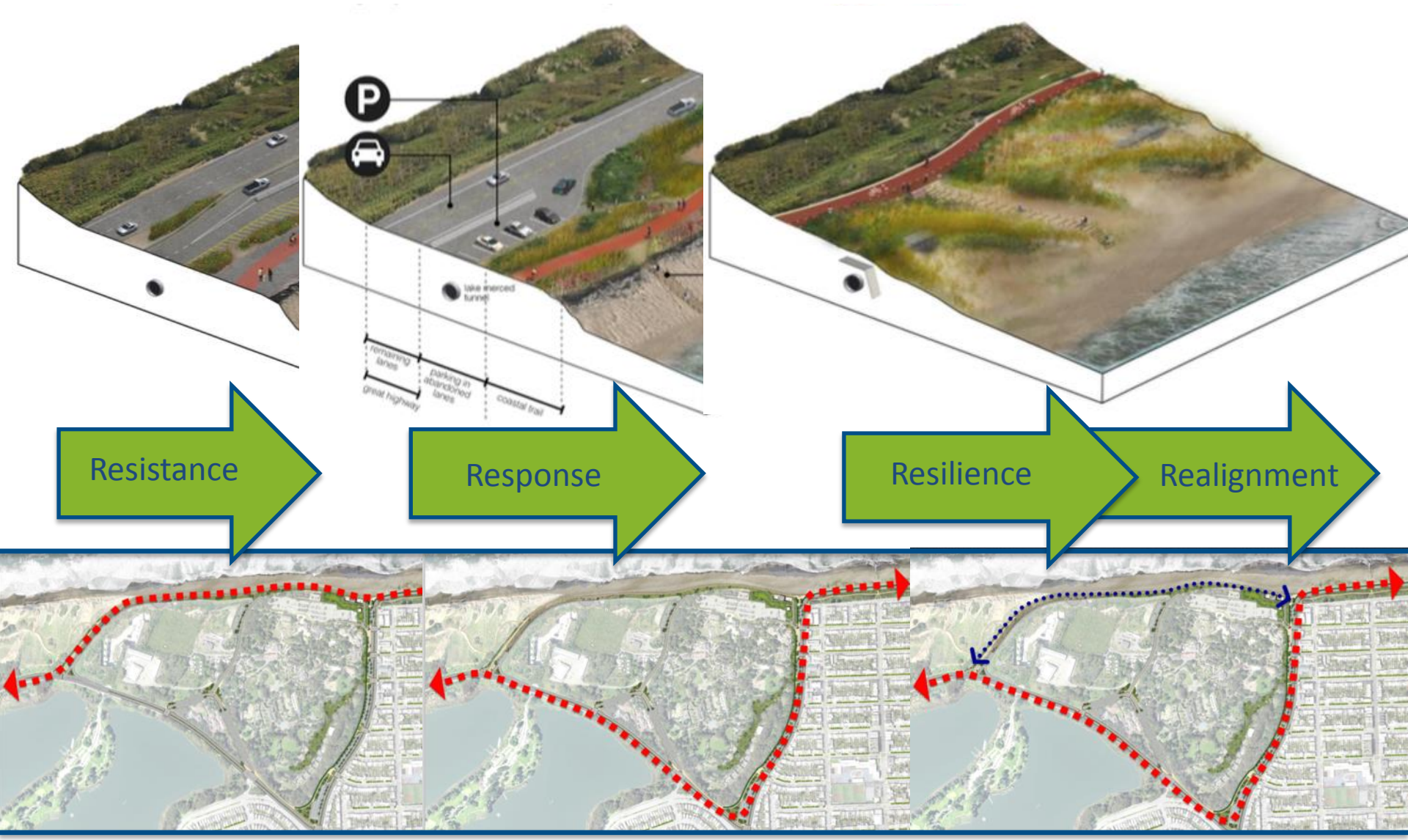
Practice rapid removal of invasive species following detection

Remove or modify structures that disrupt long-shore sediment transport and/or structures that contribute to erosion

- ☑ Resistance
- ☑ Resilience
- ☑ Response
- ☑ Realignment

Example 3:

Greater Farallones NMS: Temporal Adaptation



Images from SPUR/AECOM Ocean Climate Summit presentation, 2016

Adaptation Ladder of Engagement

- Resistance
- Resilience
- Response
- Realignment

Adaptation is a combination of these four types of actions being applied across spatial and temporal scales.

Is an iterative process that is being undertaken by us in perpetuity.

However you can think of the steps you need to take to make the continuous cycle happen as progressive.

Rapid Vulnerability Assessment

Rapid Vulnerability Assessment Concept

To use the information you have to:

- Assess how climate change will affect your system and management goals,
- Develop strategies to assess those vulnerabilities,
- Identify were gaps need to be filled before action can be taken
- Build organizational capacity to develop climate change adaptation skill and climate savvy management

Rapid Vulnerability Assessment

Proposed Process:

Step 1: Define your scope, timeline and likely stresses
Step 2: Construct your evaluation Matrix based on the parameters chosen in Step 1.
Step 3: Complete the matrix using available science and local knowledge
Step 4: Vulnerability Assessment template (for completion by local MPA managers)
Step 5: Adaptation Strategy Development

Rapid VA: Step 1

Site habitat types:
Beach
Cliffs
Rocky intertidal
Estuary/wetlands
Pelagic
Kelp Forest
Sea grass beds
Other

Timescale:
Near term
Medium (50 years)
Long (100 years)
Very long (>100 years)

Climate variables:
water temperature
Sea level rise
dissolved oxygen
Currents
sediment transport
upwelling/stratification
precipitation patterns
Ocean acidification
Turbidity
Wave action/erosion
Salinity
Storms
Harmful algal blooms
ENSO/PDO

Non-climate stressors:
Pollution
Harvest
Tourism
Aquaculture
Transport
Extraction
Energy production
Roads/armoring
Dredging
Invasive species
Boat groundings
Noise
Disease
Researcher disturbance
Other

Rapid VA: Step 2

Construct your Matrix based on the chosen parameters.

X-Axis: Habitat Types

Y-Axis: Stressors

Location:			
Timeframe of interest:		Format 1	
Habitat Type		Habitat	
Climate Stress	**What do you know about the projected manifestation of this climate impact?**	Impact on this habitat	Vulnerability to this stressor
Increasing Temperature			
Sea Level Rise			
Non-Climate Stress	How will climate change affect this stressor?	Impact of combination of climate change and non-climate stressor on this habitat	Vulnerability to this stressor
Land-source pollution			
Marine-source pollution, including spills			

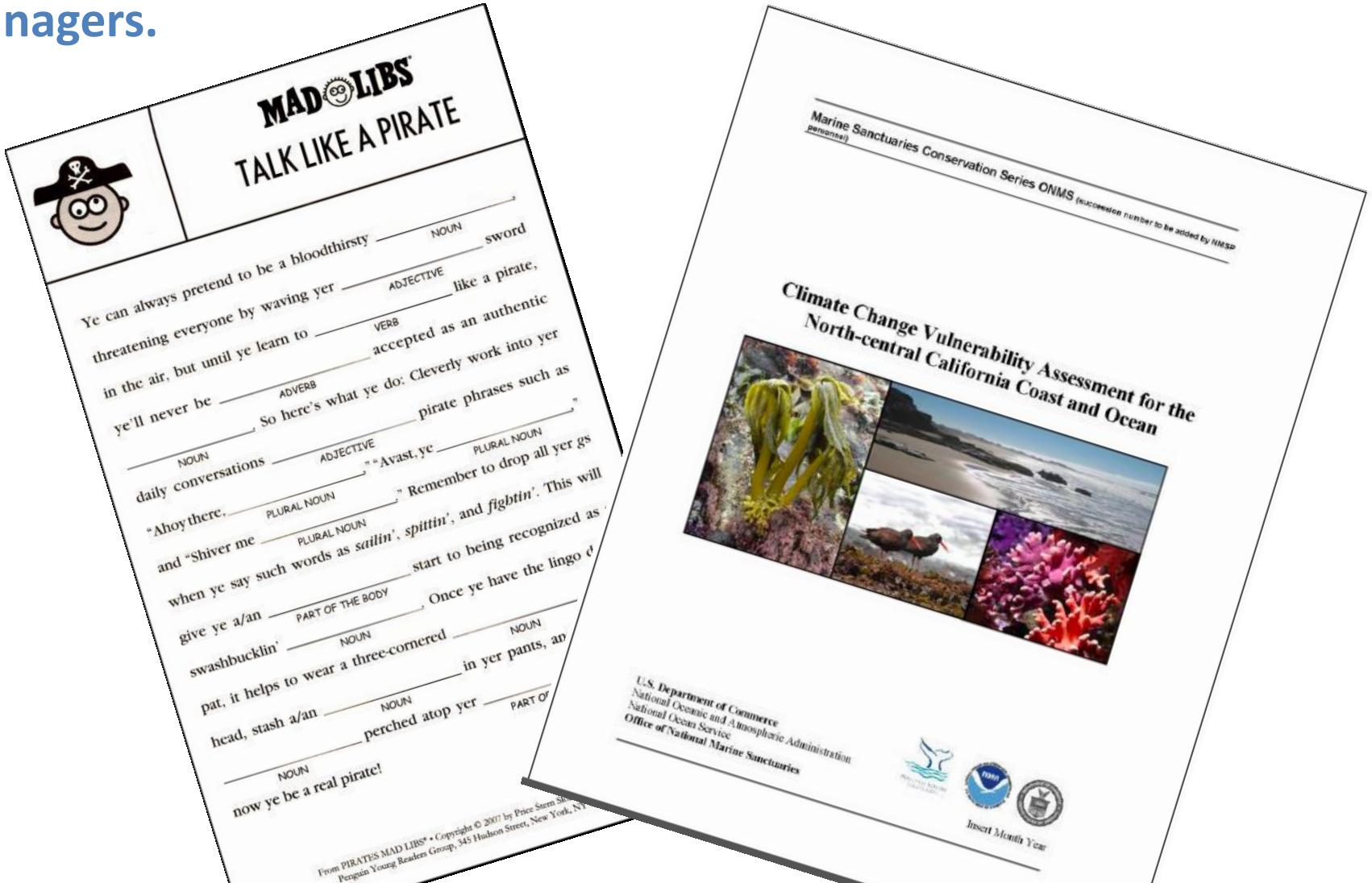
Rapid VA: Step 3

Complete the matrix using available science and local knowledge

Habitat Type	
Climate Stress	**What do you know about the projected manifestation of this climate impact?**
Increasing Temperature	Air temperatures have already increased 0.7 Deg C, water temperatures annual exceed 1 Deg C over annual summer max. Air temperatures are projected to warm up to 2 Deg C by century's end.
Sea Level Rise	Sea level has risen 20 cm in the past century, it is expected to rise over 1 m by the end of this century.
Non-Climate Stress	How will climate change affect this stressor in relation to your MPA?
Land-source nutrient pollution	Altered precipitation patterns may result in more or less land-source pollution reaching the site. If we have more rain we are likely to have great pollution run-off. However periods of drought may cause isolated but more concentrated slugs of these pollutants. Land use of some agricultural fertilizers may change, especially in agriculture which will further complicate this matter.
Land-source non-nutrient pollution	These pollutants may become more toxic with the added stresses of climate change, especially increasing temperature and decreasing pH.

Rapid VA: Step 4

Vulnerability Assessment template provided for completion by managers.



MAD LIBS

TALK LIKE A PIRATE

Ye can always pretend to be a bloodthirsty _____ (NOUN)
threatening everyone by waving yer _____ (ADJECTIVE) sword
in the air, but until ye learn to _____ (VERB) like a pirate,
ye'll never be _____ (ADVERB) accepted as an authentic
_____ (NOUN), So here's what ye do: Cleverly work into yer
daily conversations _____ (ADJECTIVE) pirate phrases such as
"Ahoy there, _____ (PLURAL NOUN)," "Avast, ye _____ (PLURAL NOUN),"
and "Shiver me _____ (PLURAL NOUN)." Remember to drop all yer gs
when ye say such words as *sailin'*, *spittin'*, and *fightin'*. This will
give ye a/an _____ (PART OF THE BODY) start to being recognized as
swashbucklin' _____ (NOUN). Once ye have the lingo d
pat, it helps to wear a three-cornered _____ (NOUN)
head, stash a/an _____ (NOUN) in yer pants, an
_____ (NOUN) perched atop yer _____ (PART O
now ye be a real pirate!

From PIRATES MAD LIBS® • Copyright © 2007 by Price Stern Sl
Penguin Young Readers Group, 345 Hudson Street, New York, NY

Marine Sanctuaries Conservation Series ONMS (succession number to be added by NMSP
personnel)

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Insert Month Year

Rapid VA: Step 5

Adaptation Strategy Development

	Adaptive capacity		
Impact	**Low**	**Medium**	**High**
Extreme	High	High	Moderate
High	High	Moderate	Moderate
Medium	Moderate	Moderate	Low
Low	Low	Low	Low

Queensland Climate Change Centre for Excellence 2011

For each stress with a high or moderate vulnerability score, develop a list of adaptation strategies that could respond to that stress alone or multiple high and medium vulnerability stresses.

For each strategy list the potential partners, opportunities, funding and management mechanisms, and timeline for implementation.

Find adaptation examples on CAKE

cake
Climate Adaptation Knowledge Exchange

Enter Keywords

CASE STUDIES | VIRTUAL LIBRARY | DIRECTORY | TOOLS | COMMUNITY

Resilience Assessment of Coral Reefs: Rapid Assessment Protocol for Coral Reefs, Focusing on Coral Bleaching and Thermal Stress

Case Study | Virtual Library | Directory | Tools | Community

SEARCH CAKE

Click on the map or type in the search box below.

Enter Keywords SEARCH

Or Browse All CAKE Content

NEW TO ADAPTATION?

Need help? **Start here.**
We'll get you on the right track!

DON'T PANIC!

JOIN & SUBMIT

CONNECT WITH CAKE

What is CAKE?

CAKEx.org

Always remember…

Holistic, durable long-term solutions will require a combination of these approaches over the space and time. But you have to start somewhere. A rapid vulnerability assessment is not a bad start.

- ☐ Resistance
- ☐ Resilience
- ☐ Response
- ☐ Realignment

Want to know more

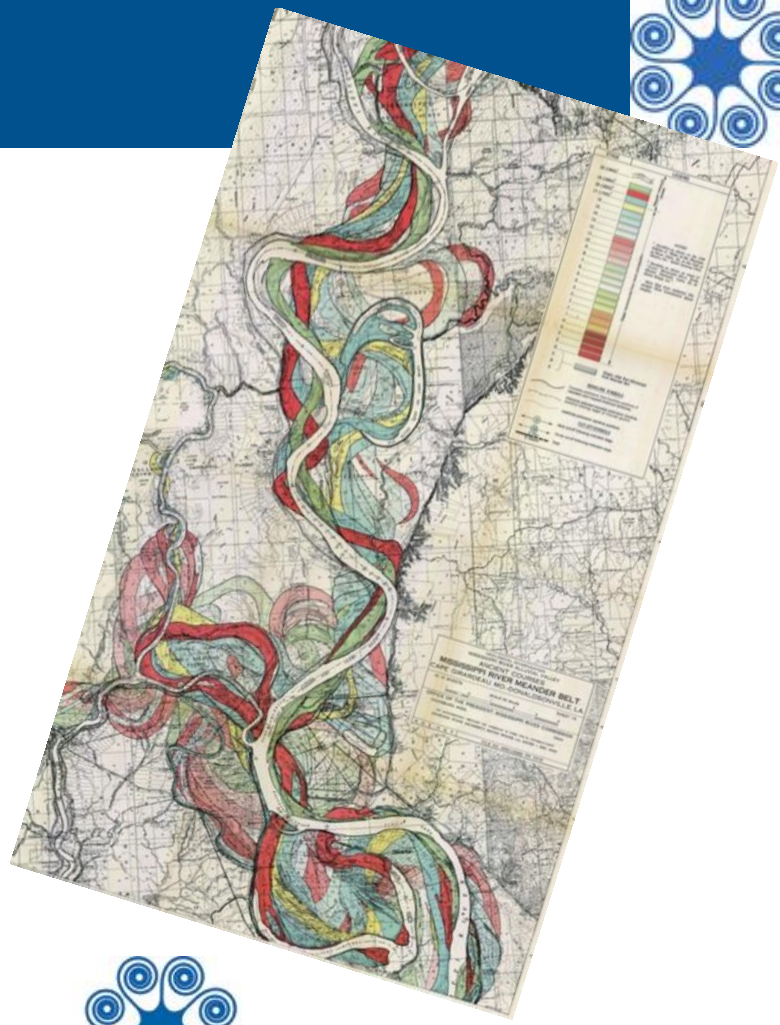
Contact: Lara@EcoAdapt.org

Join: CAKEx.org

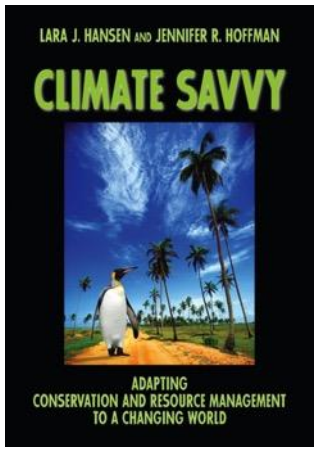
cake
Climate Adaptation Knowledge Exchange

Attend: National Adaptation Forum

NATIONAL ADAPTATION FORUM
ACTION TODAY FOR A BETTER TOMORROW ™



Read:



Visit:

EcoAdapt™
Meeting the challenges of climate change

EcoAdapt.org

EcoAdapt™

Meeting the challenges of climate change

State of Adaptation Program

finding out how people are fishing

Awareness to Action

teaching others to fish

Climate Adaptation Knowledge Exchange (CAKEx.org)

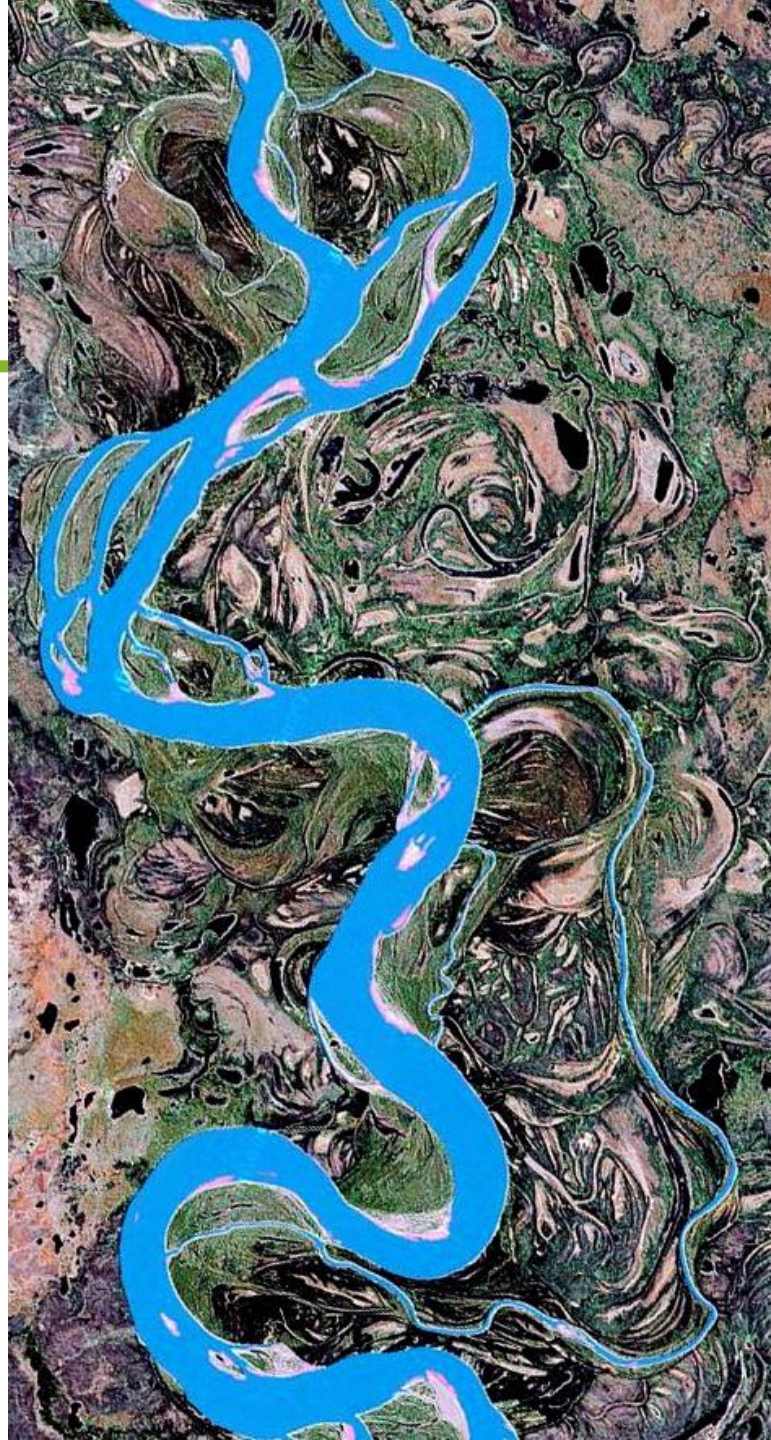
connecting the fishing community

Adaptation Consultation

we fish for you

National Adaptation Forum

share your fishing stories



Adaptation: 5 Tenets

1. Protect adequately and appropriately for a changing world

2. Reduce non-climate stressors that are exacerbated by or exacerbate the effects of climate change

3. Manage for uncertainty

4. Reduce the rate and extent of local and regional climate change

5. Reduce the rate and extent of global climate change